REMARKS/ARGUMENTS

Claims 1-35 and 37-53 are pending and rejected in this application. Claim 36 was previously cancelled. In view of the following remarks, Applicants request allowance of the Application.

CLAIM REJECTIONS – 35 USC § 103

Claims 1, 9-10, 23-26, 40 and 44 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Yanagihara, US Pat. No. 5,374,958 in view of Pian et al., (hereinafter "Pian"), US Pat. No. 6,366,614 and further in view of Chiang et al., (hereinafter "Chiang"), "A New Rate Control Scheme Using Quadratic Rate Distortion Model, IEEE, 1996, pgs. 73-76. Claims 49 and 50-53 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Yanagihara, US Pat. No. 5,374,958 in view of Pian, US Pat. No. 6,366,614 in view of Chiang, and further in view of Nam et al., (hereinafter "Nam"), US Pat. No. 5,617,150. Claim 50 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Yanagihara, in view of Pian. Claim 11 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Yanagihara, in view of Pian, in view of Chiang, in view of Eckart, US Pat. No. 7,277,483. Claims 2, 8, 27 and 33 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Yanagihara, in view of Pian, in view of Chiang and further in view of Kim, US Pat. No. 5,777,812. Claims 3, 28, 41 and 43 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Yanagihara, in view of Pian, in view of Chiang, in view of Kim, and further in view of Simpson et al., (hereinafter "Simpson"), US Pat. No. 6,724,817. Claims 4, 29 and 42 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Yanagihara, in view of Pian, in view of Chiang, in view of Kim, in view of Simpson, and further in view of Sugiyama, US Pat. No. 6,940,911. Claims 4, 29 and 42 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Yanagihara, in view of Pian, in view of Chiang, in view of Kim, in view of Simpson, in view of Sugiyama, and further in view of Cheung et al., (hereinafter "Cheung"), US Pat. No. 6,178,205. Claims 4, 5, 29-30 and 42-43 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Yanagihara, in view of Pian, in view of Chiang, in view of Simpson, and further in view of Sugiyama. Claims 6-7, 31 and 32 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Yanagihara, in view of Pian, in view of Chiang, in view of Kim, and further in view of Tsuru, US Pat. No. 6,950,040. Claims 12-14 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Yanagihara in view of Pian. Claim 15 is rejected under 35 U.S.C. § 103(a) as

being unpatentable over Yanagihara, in view of Pian, and further in view of Eckart. Claims 16 and 22 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Yanagihara, in view of Pian, in view of Hui, US Pat. No. 6,654,417 and further in view of Kim. Claim 17 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Yanagihara, in view of Pian, in view of Hui, in view of Kim, and further in view of Alattar et al., (hereinafter "Alattar"), US Pat. No. 7,567,721. Claim 18 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Yanagihara, in view of Pian, in view of Hui, in view of Kim, and further in view of Takeuchui et al., (hereinafter "Takeuchui"), US Pub. No. 2002/0028061. Claim 19 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Yanagihara, in view of Pian, in view of Hui, in view of Kim, and further in view of Cheung. Claims 20-21 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Yanagihara, in view of Pian in view of Hui, in view of Kim, and further in view of Tsuru. Claims 34, 38 and 39 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Yanagihara, in view of Sugiyama, and further in view of Cheung. Claim 35 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Yanagihara, in view of Sugiyama, in view of Cheung, and further in view of Alattar. Claim 37 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Hui, in view of Sugiyama, and further in view of Tsuru.

CLAIMS 1-11, 40-47, 49 AND 51-52 DEFINE OVER THE PRIOR ART

The combination of Yanagihara, Pian and Chiang does not teach or suggest at least the below-discussed elements of the rate and quality control system recited in representative claim 1, and independent claims 40 and 44, which recite similar subject matter. Independent claim 1 recites:

> Rate and quality control system for an AVC-based video coder, comprising:
>
> a picture analyzer, to generate complexity indicators from each picture of an input video sequence;
>
> a first quantizer estimator to generate a first quantizer estimate for each picture based on the complexity indicators, a target coding rate calculated for each picture and a transmit buffer fullness indicator representing a quantity of stored previously-coded video data;
>
> a second quantizer estimator, to generate a second quantizer estimate for each picture, the second quantizer estimates for I and P pictures based on a linear regression analysis of quantizers and coding rates of previously-coded pictures;

a quantizer selector to generate a quantizer parameter for each picture from the first and second quantizer estimates; and

a coding policy unit operative according to a rate control policy, wherein the rate control policy is selected based at least on a comparison of the first and second quantizer estimates.

Applicants respectfully point out that the Examiner has cited the same two excerpts of Yanagihara for the first quantizer estimator, the second quantizer estimator and the quantizer selector, namely 12:20-38 and 13:62-14:19. As far as Applicants can tell, Yanagihara simply chooses ***one set*** from among 16 pre-defined sets of 8 quantizer step sizes each, where each quantizer in each set corresponds to one of area numbers 0 to 7; the set that "corresponds to the greatest amount of encoded data for five macro blocks that is equal to or less than a predetermined value" is the set that is chosen. (Yanagihara, 6:37-49 and 14:50-54.) Yanagihara's discussion is not relevant to the pending claim language. Claim 1 refers to two quantizer estimates for a common picture based on two different sets of criteria. A first quantizer estimate is generated from complexity indicators, target coding rates, and a transmit buffer fullness indicator, and a second quantizer estimate is generated from, for I and P pictures, a linear regression analysis of quantizers and coding rates of previously-coded pictures. As noted, the Examiner cites to a single process as allegedly corresponding to the two quantizer estimates recited in claim 1. This single process, however, has only a single criteria to generate Yanagihara's quantizer. Thus, the cited art, even if considered in combination, fails to teach or suggest this subject matter of the pending claims.

Further, the cited art does not teach or suggest a coding policy unit operative according to a rate control policy, wherein the rate control policy is selected based at least on a comparison of the first and second quantizer estimates. Applicants have read the cited passages of Pian (i.e., 4:44-62 and 6:30-41), but fail to see any teaching or suggestion that a rate control policy is selected based at least on the comparison of two quantizer estimates. From what Applicants can deduce, Pian simply "compares the three rates r_1-r_3 with a desired bit rate in order to choose the rate closest to the desired bit rate." (Pian, 6:34-37.)

For at least these reasons, Applicants believe that the rejections of independent claims 1, 40 and 44, and their associated dependent claims, should be reconsidered and withdrawn.

CLAIMS 12-22, 48, 50 AND 52 DEFINE OVER THE PRIOR ART

Independent claim 12 recites:

> Rate and quality control system for an AVC-based video coder, comprising:
>
> a content characteristics and coding rate analyzer, responsive to pictures from an input video sequence, to generate complexity indicators representative thereof,
>
> a target bits computer, responsive to the complexity indicators and to a picture type signal, to calculate a target coding rate for each picture in the video sequence,
>
> a buffer based quantizer computer, responsive to the target coding rates, to a transmit buffer indicator signal and to the picture type signal, to generate a buffer-based quantizer estimate for each picture, and
>
> an activity based quantizer computer to calculate activity of each picture in the video sequence and modify the buffer-based quantizer estimate in response thereto,
>
> an AVC coder including a forward quantizer operative according to the modified buffer-based quantizer estimate.

Applicants can find no teaching or suggestion in the Yanagihara passages cited by the Examiner (i.e., 12:20-38 and 13:62-14:19) of an activity based quantizer computer to calculate the ***activity of each picture*** and ***modify*** the buffer-based quantizer estimate in response thereto. Indeed, and as discussed above with respect to claim 1, the most that can be said about Yanagihara in this instance is that he chooses one set from among 16 pre-defined sets of 8 quantizer step sizes – where each quantizer in the set corresponds to one of eight areas of an image – based on a determination of which set generates the most encoded data equal to or less than a predetermined amount. (Yanagihara, 6:37-49 and 14:50-54.) While the pre-defined sets of quantizers may be adjusted, before they are used to generate encoded data, by an activity class associated with each DCT block (Yanagihara, 14:8-10), there simply is no teaching or suggestion of an activity based quantizer computer that ***modifies*** a previously generated ***buffer-based quantizer estimate*** for the ***picture*** in response to a calculation of the picture's activity.

Further, the Examiner asserts that Yanagihara teaches both the generation of complexity indicators ***and*** the calculation of activity for each picture, yet cites the same passages as teaching both. Clearly an indication of complexity and a calculation of activity are

distinct metrics, and as such, ***both*** cannot be taught, if taught at all, by the same element; in this case, that singular element is the activity code(s) determined by Yanagihara (which, again, are determined for each DCT block, not for each picture).

Finally, the Examiner asserts that Pian discloses a target bits computer, responsive to the complexity indicators and to a picture type signal, to calculate a target coding rate for each picture in the video sequence. As far as Applicants can tell, Pian makes no mention of complexity indicators or picture type signals, much less discloses using those values to calculate a target coding rate for each picture in the video sequence. While target bit rate update element 38 (from FIG. 3, as cited by the Examiner) "derives an updated target bit rate," that target bit rate is for "the next segment of video," and its only input is from rate buffer status indicator 40. (Pian, 7:12-14 and 8:4-7; emphasis Applicants'.)

For at least these reasons, Applicants believe that the rejections of independent claim 12, and independent claim 48, which recites similar subject matter, and their associated dependent claims should be reconsidered and withdrawn.

CLAIMS 23-33 DEFINE OVER THE PRIOR ART

Independent claim 23 recites in part:

> a rate model quantizer estimator, responsive to quantizers and coding rates of previously-coded pictures and to picture type indicators of input pictures, to estimate quantizer parameters of the input pictures according to a linear regression analysis, **wherein linear regression coefficients of input I pictures are selected according to the complexity indicators for such I pictures**,

The combination of Yanagihara and Chiang does not teach or suggest at least the above-highlighted elements of the rate and quality control system recited in claim 23. Nowhere does Yanagihara or Chiang disclose selecting ***linear regression coefficients*** of input I pictures ***according to complexity indicators***.

For at least these reasons, Applicants believe that the rejections of independent claim 23 and it associated dependent claims should be reconsidered and withdrawn.

CLAIMS 34-35 AND 37-39 DEFINE OVER THE PRIOR ART

Independent claim 34 recites in part:

> wherein the video coding chain deletes motion vectors under control of the rate controller.

The combination of Yanagihara, Sugiyama, and Cheung does not teach or suggest at least the above-highlighted element of the video coding system recited in independent claim 34. In particular, the combination does not teach wherein the video coding chain deletes motion vectors under control of the rate controller. As disclosing this element, the Examiner cites Cheung, specifically 8:18-33 and 8:60-9:5. Applicants respectfully disagree. Cheung is directed to a ***decoding*** process to "improve image quality [of a video image] by removing ***coding*** artifacts and noise." (Cheung, FIG. 1 and 1:50-52; emphasis Applicants'.) Clearly then, whatever Cheung does, it is not ***under control of the rate controller*** as is required by the claim.

For at least these reasons, Applicants believe that the rejections of claim 34 and its associated dependent claims should be reconsidered and withdrawn.

CONCLUSION

All outstanding rejections have been overcome. It is respectfully submitted that, in view of the foregoing remarks, the application is in clear condition for allowance. Issuance of a Notice of Allowance is earnestly solicited.

Although not believed necessary, the Office is hereby authorized to charge any fees required under 37 C.F.R. § 1.16 or § 1.17 or credit any overpayments to Deposit Account No. 11-0600.

The Office is invited to contact the undersigned at (408) 975-7500 to discuss any matter regarding this application.

Respectfully submitted,

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Date: March 29, 2010

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